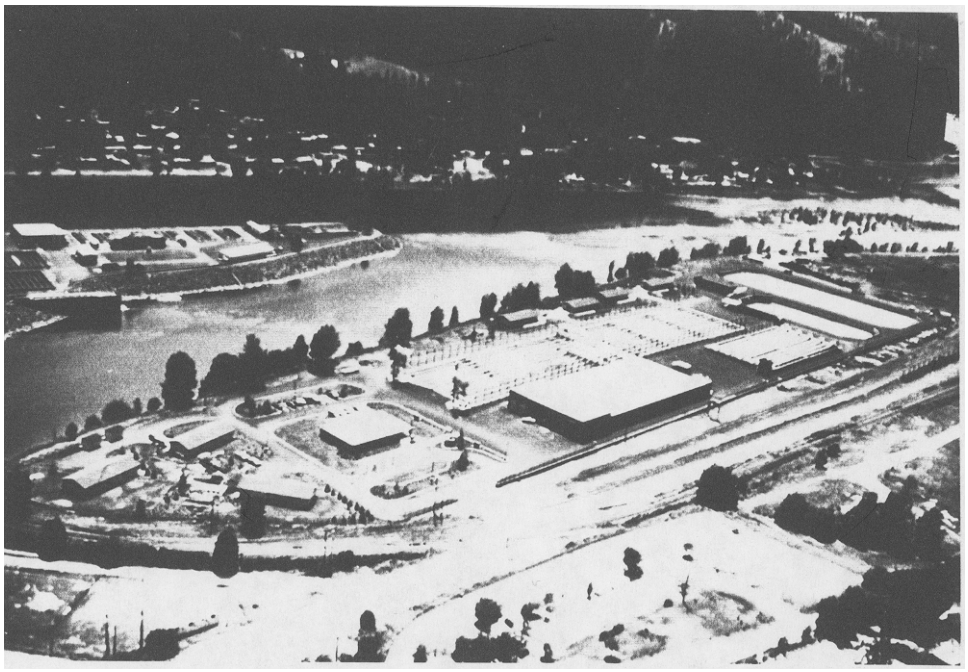
CLEARWATER FISH HATCHERY

1995 Chinook Brook Year
1996 Steelhead Brood Year Report



by

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ABSTRACT

Clearwater Hatchery

Chinook salmon *Oncorhynchus tshawytscha* are raised at Clearwater Hatchery. All chinook are brought on station as either green or eyed eggs, then reared on station until they are transported to the satellite facilities or directly released.

Crooked River

The Crooked River weir was installed on March 14, 1995 and taken out of operation on September 5, 1995. The run total was six fish, all jacks. Five of these jacks were held and spawned with the one Red River female.

Crooked River trap does not have an adult holding facility. Ponded fish were removed from trap and transported 28 miles to the Red River facility. All Crooked River chinook were segregated from the Red River chinook.

No full term smolts from Crooked River stock chinook were released during out migrant year 1997.

Powell

The Walton Creek weir was installed on May 26, 1995 and taken out of operation on September 5, 1995. The run total was 14 fish; one adult male, one adult female, and 12 jacks. All fish trapped were ponded and held for spawning. One female was spawned and produced 5,259 green eggs.

A total of 3,549 full term smolts from Powell stock chinook were released from Powell pond on April 14, 1997.

Red River

Red River weir was installed on June 12, 1995 and taken out of operation on September 5, 1995. The run total was four fish; one adult female, two jacks, and one jill. One male and one female were released to spawn naturally. Of these, one female was spawned which produced 4,376 green eggs.

A total of 2,983 spring chinook full term smolts were released from the Red River pond on April 14, 1997.

Rapid River

During the 1994 spawning season, eggs from three Rapid River females were transferred to Clearwater Fish Hatchery. A total of 16,402 eggs were received, all high Bacterial Kidney Disease (BKD) parentage. These eggs were segregated from all other fish for the entire rearing cycle.

A total of 13,470 Rapid River stock chinook full term smolts were released Rapid River Hatchery on April 15, 1997.

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INTRODUCTION

Funding Source

Construction responsibility for the Lower Snake River Compensation Plan (LSRCP) was assigned to the Walla Walla District, Army Corps of Engineers (Corps), while responsibility for fish hatchery Operation and Maintenance (O&M) funding was to be accomplished by "one of the Federal fishery agencies." The question of O & M funding was settled in 1977 with the signing of an interagency agreement by the Corps, National Marines Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS). The agreement stated that the FWS would budget for and administer O&M funding for LSRCP fish hatchery programs (responsibility for administration and O&M for fish passage and wildlife programs remains with the Corps).

The Corps estimated cost for construction of Clearwater Hatchery and three satellite facilities was to be $43,153,000 (Joe McMichael's report December 1991).

Location

Clearwater Fish Hatchery is on the north bank of the North Fork of the Clearwater River, 1.5 miles down stream from Dworshak Dam, 72.5 miles upstream from Lower Granite Dam and 504 miles upstream from the mouth of the Columbia River.

Crooked River satellite facility is 20 miles downstream of Red River. The trap is one-half mile upstream of the mouth of Crooked River, a tributary of the South Fork of the Clearwater River. The juvenile rearing ponds are ten miles upstream from the Crooked River adult trap. Crooked River is 172.5 miles upstream from Lower Granite Dam and 604 miles upstream from the mouth of the Columbia River.

Powell satellite facility is 122 miles east of the Clearwater Hatchery at the headwaters of the Lochsa River. Missoula, Montana is the closest town, which is 45 miles east. Powell is 192.5 miles upstream from Lower Granite Dam and 624 miles upstream from the mouth of the Columbia River.

Red River satellite facility is 15 miles east of Elk City, Idaho, 186 miles upstream from Lower Granite Dam and 618 miles from the mouth of the Columbia River.

OBJECTIVES

Mitigation Goals

The goal of Clearwater Fish Hatchery and satellite facilities is to return 12,000 adult salmon and 14,000 adult steelhead over Lower Granite Dam.

Idaho Department of Fish and Game Objectives

The objectives of Idaho Department of Fish and Game (Department) for the Clearwater Hatchery are to reestablish historic fish runs into the upper Clearwater River tributaries, to enhance the wild spawning population, and increase sport and tribal fish opportunities.

FACILITY DESCRIPTION
General Hatchery Description

Clearwater Hatchery

The Clearwater Fish Hatchery is the final facility built by the U.S. Army Corps of Engineers under the Lower Snake River Compensation Plan. This facility is also the largest of the LSRCP hatcheries built.

Support buildings include the administration/dormitory building. The dormitory section includes four bunkrooms with maximum capacity of 16 people, a living room, dining room, a kitchen, shower rooms for men and women, and a laundry room. The administration portion consists of office space with a visitor reception area is the entry way to the office.

The shop area includes a vehicle maintenance shop and a smaller mechanical repair shop. A screen storage room has been altered for use as a carpentry shop.

The hatchery building also houses an incubation room and walk-in freezer. A screen and equipment storage building is on the west end of the hatchery.

There are seven residences on the hatchery grounds. Each residence also has a storage building.

Isolation incubation building for receiving eggs with unknown disease status and a chemical storage building for storing barrels of formalin and chlorine.

A 1.8 mile long pipeline runs upstream to the Dworshak Dam. The pipeline goes up the face of the dam to an elevation of 1,357 feet then through the dam into the reservoir. The 18-inch pipe is stationary at an elevation of 1,357 feet with a screened inlet to keep out debris. This pipe supplies cool water to the hatchery. The 48-inch flexible plastic pipe suspended from a floating platform with a winch attached to the platform, which raises and lowers the intake of the pipe to the level of desired water temperature. This pipe supplies warm water to the hatchery.

Near the dam is a distribution structure designed to reduce the 286 psi of the high pressure supply lines to the gravity flow of seven psi to the hatchery. The structure consists of a primary and secondary chamber. Each chamber has two ported sleeve valves used to reduce the pressure. One valve is in operation while the other is on a standby for emergencies.

A 73,600 cubic foot cleaning sedimentation pond is used during cleaning to settle out the settleable solids produced by the hatchery. A 414,000 cubic foot final sedimentation pond settles waste from the total flow of hatchery operation and the out flow of the cleaning sediment.

Crooked River

There are two separate sites to this facility. The first is the adult trap and a support cabin located one-half mile upstream of the mouth of Crooked River. The weir at this location consists of removable posts and panels supported by an iron bridge across Crooked River. The trap is a 9-ft x 13 ft x 4 ft deep holding container. There are no holding ponds at the site, and all fish are either released directly from the trap or transported to Red River holding ponds.

Ten miles upstream from the adult trap are two raceways measuring 145 ft x 20 ft x 4 ft deep with 23,200 cubic feet of rearing space. There is a cleaning waste pond and final settling pond to meet EPA water quality standards. Additional facilities include a garage, shop, a walk-in freezer to store fish food, and a support cabin with kitchen, dining room, living room, bathroom and bedroom.

Powell

The Powell facility is at the confluence of Crooked Fork and White Sands Creek, which form the Lochsa River. There is one rearing pond that measures 165 ft x 65 ft x 5 ft deep. A diversion and intake screen structure are on Walton Creek, and a pump house on White Sands Creek. There are two adult ponds that measure 100 ft x 12 ft x 4 ft deep. A weir diverts fish that come up into Walton Creek into the fish ladder and fish trap. A floating weir that spans across the Lochsa River is stored at the facility for use when needed. An open bay spawning shelter at the head of the adult pond provides workspace. Also, on site is a support cabin with a kitchen, dining room, living room, bedroom, bathroom, and walk-in freezer to store fish feed. During the summer of 1994 the Corps of Engineers constructed a 16-ft x 14-ft chemical storage building.

Red River

The Red River site consists of three structures built on 6.29 acres. A freezer storage building housing a walk-in freezer, some dry storage shelves, an area to weigh out daily feed, a workshop, and chemical storage building, and a support cabin.

Production Capacities by Unit

Clearwater Hatchery

The steelhead rearing facilities consist of 300 ft x 10 ft x 6-ft deep raceways supplied by a center head raceway with an east and west bank of 12 raceways. A total rearing space of 24 raceways is 216,000 cubic feet. This area will rear a maximum capacity of 2.4 million steelhead smolts with 0.3 density index (DI) (Piper). A flow of approximately 1.67 cubic feet per second (cfs) is available for each raceway, but it is suspected that this flow will only allow 1.7 million steelhead to be reared in these raceways without exceeding the flow index (FI) of 1.2 (Piper). All water for these raceways flow through degassing towers then into the head raceway. These raceways are supplied with water from the surface intake only.

Chinook raceways are 200 ft x 10 ft x 3 ft deep. Eleven raceways have a total rearing space of 66,000 cubic feet. The raceways are supplied with water from both primary and secondary

intakes and a mixing chamber, which allows for the control of water temperature to rear chinook. The designed rearing capacity of these raceways is 1.5 million smolts at a 0.3 DI (Piper). The estimated flow per raceway is 2.4 cfs per raceway.

The adult holding facility consists of two ponds with a combined capacity of 8,000 cubic feet and a maximum holding capacity of 800 adult salmon. There is also a covered spawning area with two live wells for on-site egg taking. This facility is supplied with water from the tail race of the juvenile chinook raceways. Estimated flow per pond is 3.5 cfs.

The incubation room contains 40 double stack Heath incubators with a total of 640 trays available for egg incubation. The upper and lower half of each stack (eight trays each) has a different water supply and drain. This design aids in segregation of diseased eggs. The maximum capacity of this facility is five million green eggs. The incubation room is supplied with both water sources to provide the desired temperature for incubation with a flow of 5 gpm. to 8 gpm. per one-half stack.

Sixty concrete vats, measuring 40 ft x 4 ft x 3 ft deep, are inside the hatchery building for early rearing and contains 480 cubic feet of rearing space in each. This part of the facility can rear 5.9 million fish to 287 fish/lb at a 0.3 DI. The vats are supplied with water from each intake and have a flow of approximately 120 gallons per minute per vat when all vats are in use. Every vat also has an incubation jar plumbed directly into them, the incubator jars have a total capacity of 2.6 million eggs with a flow of 15 gpm. per jar.

Crooked River

The Crooked River facility has two raceways, measuring 145 ft x 20 ft x 4 ft deep, for a total of 23,200 cubic feet. These raceways have a capacity of 700,000 juvenile chinook with a DI of 0.29. Water flow per raceway is six cfs. Each raceway is outfitted with three automatic Nielson feeders. The adult trapping facility measures 10 ft x 12 ft x 4 ft deep with a total of 480 cubic feet. Water flow for the adult facility is 10 cfs.

Powell

The rearing pond measures 165 ft x 65 ft x 5 ft deep and has 53,625 cubic feet of rearing space. The normal loading of 320,000 fish produces the best looking smolts and a DI significantly less than 0.3. The maximum design capacity is 500,000 fish with a DI of 0.092. Water flow through this pond is 6.24 cfs. A catwalk across the length of the pond supports eight automated Nielson feeders.

The adult ponds, measuring 100 ft x 20 ft x 4 ft 8 in. deep, have a volume of 9,500 cubic feet and a holding capacity of 960 adult chinook. The adult trap measures 12 ft x 6 ft x 4 ft deep and is supplied with 6.24 cfs of water.

Red River

The adult holding facility consists of two ponds, measuring 10 ft x 45 ft x 4 ft deep, with a total of 3,400 cubic feet of holding space and a trap area 8 ft x 16 ft x 4 ft deep. These ponds have a

holding capacity of 350 fish. Removable tripod and panel weirs block fish passage and divert them into the fish ladder. Water flow through the ponds and trap is 4.09 cfs.

A 170 ft x 70 ft x 4 ft 6 in. deep rearing pond will rear a maximum of 320,000 chinook smolts. This pond has a hypalon plastic liner with eight to ten inch diameter cobblestones on the inclined banks. The bottom of the pond is a bare liner, which aids in pond vacuuming. A catwalk runs the entire length of the rearing pond and holds eight automatic Nielson feeders. Water flow through the pond is 4.09 cfs.

WATER SUPPLY

Source

Clearwater

Clearwater Fish Hatchery receives water through two supply pipelines from Dworshak Reservoir. The warm water intake is attached to a floating platform and can be adjusted from five feet to forty feet below the surface. The cool water intake is stationary at 245 feet below the top of the dam. An estimated 10 cfs of water is provided by the cool water supply and 70 cfs of water from the warm water supply. The cool water supply has remained constant at 40^{o}F. The warm water can reach 80^{o}F but is adjusted regularly to maintain 56^{o}F for as long as possible throughout the year. When water temperatures drop in the fall the intake will be moved to the 40^{o}F level until water temperatures rise in the spring (Appendices A1 and A2). All water is gravity flow to the hatchery.

Crooked River

Crooked River rearing raceways are supplied by an intake 200 yards upstream of the raceways at Crooked River. The water rights stipulate cfs at the rearing facility; in late summer only six cfs is available. The water right is for 10 cfs at the adult trapping facility. Temperatures ranged from 62^{o}F in mid-August to 46^{o}F in late September (Appendix B1). All temperatures were taken at the adult trap. All water supplied to both facilities is gravity flow.

Powell

The intake is 100 yards upstream from the facility. Powell's water right for the gravity intake is 6.24 cfs from a gravity flow system on Walton Creek, and 2.5 cfs from a supply pumped out of White Sands Creek. Two 7.5 horsepower pumps can be used to supply Walton Creek with water from White Sands Creek during periods of low water. Water temperatures ranged from 61 to 43^{o}F from the Walton Creek (Appendix B2).

Red River

Red River is supplied by gravity flow from an intake at the bottom of the South Fork of Red River, 225 yards upstream from the facility. The water right for the facility is 8.18 cfs. During low flow in the summer, about five cfs is available to the hatchery. Temperatures ranged from 44°F in the fall to 61°F in early August. Historically maximum water temperatures have been 70°F or higher (Appendix B3).

Water Quality Analysis

Clearwater

The Idaho Department of Health and Welfare water quality laboratory in Boise did the water quality analysis report. The samples were taken from the hatchery incubation supply line on August 4, 1994 (Appendix C1).

Clearwater Hatchery's water supply has a total alkalinity (as $CaCO_3$) of 16 mg/1, which is very low regarding fish culture.

Crooked River

Water quality analysis was taken at the rearing facility intake on July 14, 1994 (Appendix C2).

Powell

Water quality analysis was taken at the rearing facility intake on July 27, 1994 (Appendix C3).

Red River

Water quality analysis was taken at the rearing facility intake on July 20, 1994 (Appendix C4).

STAFFING

Clearwater Fish Hatchery has eight permanent staff employees; one Fish Hatchery Manager II, two Assistant Hatchery Managers, one Utility Craftsman, three Fish Culturists and Office Secretary. The rest of the crew consists of temporary employees with the positions as Fishery Technicians, Biological Aides, Laborers, and Mechanics Assistant, Grounds Maintenance Worker and Clearwater Youth Program enrollees. One temporary person mans the Red River, Crooked River and Powell facilities each, which are supervised from the Clearwater Hatchery.

1995 CHINOOK BROOD YEAR REPORT

Adult Chinook Collection

Crooked River

The weir and trap were put into operation on March 14, 1995 and taken out of operation on September 5, 1995. A total of six fish were trapped, all jacks (Appendices D1, D2 and D3). Flow through the trap for adult attraction was 10 cfs.

Age class breakdown of this run was six three-year-old males. The age class breakdown was as follows: less than 25 inches (64cm) were jacks or jills, more than 25 inches (64cm) to 32 inches (82cm) were four-year-olds and 32 inches and over were five-year-olds. The breakdown is from limited historic CWT data (Appendices D3, E and F).

Holding and Spawning

There is no adult holding at this site. Fish trapped from this facility are transported 28 miles to the Red River facility. These adults were held separate from the Red River stock.

All fish were injected with erythromycin 200 at a rate of 20 mg/kg to inhibit BKD. Fish being held were also treated every other day with a 100-ppm formalin drip for one hour to prevent the growth of fungus. After the first sort these fish were treated every day with 100 ppm formalin drip for one hour. All mortalities were returned to Red River to add nutrients to the system. (Appendix G for individual egg take numbers).

Adult Chinook Collection

Powell

The weir and trap on Walton Creek were installed on May 26, 1995 and taken out of operation on September 5, 1995. A total of 14 fish were trapped, one male, one female and 12 jacks (Appendices H1, H2 and H3).

The floating weir across the Lochsa River was not installed this year. Marked fish returning to the Powell trap was considered hatchery stock and were ponded for spawning. Flow through the trap and ponds were 6.2 cfs. Pre-spawning mortalities were zero (Appendix I).

Age class breakdown of this run was 12 jacks, one four-year-old male, and one five-year-old female. The age class breakdown was as follows: less than 25 inches (64cm) were jacks, more than 25 inches (64 cm) to 32 inches (82cm) were four-year-old and 32 inches (82cm) and over were five-year-olds. Our breakdown is from limited historic CWT data from Region 2 Fisheries Biologist (Appendices H3, I and J).

Holding and Spawning

Ponded fish were injected with erythromycin 200 at a rate of 20 mg/kg to inhibit BKD. Fish being held for spawning were also treated every other day with 100-ppm formalin drip for one hour. After the first sorting, all fish were treated every day with 100-ppm formalin drip for one hour.

Ponded fish were sorted twice per week for ripeness. The single female was spawned on August 21, 1995. Fish carcasses were placed in Walton Creek to add nutrients to the stream.

Eggs were water hardened in a 100-ppm Argentyne solution for one hour in egg tubes, drained and transported in fresh water to Clearwater Fish Hatchery for incubation. Tissue and ovarian samples were collected at the time of spawning. These samples were air mailed the next day to Eagle Fish Health Lab for BKD and virus testing. (Appendix G for individual egg take numbers).

Egg Transport

After water hardening at the adult facility green eggs were transported to Clearwater Fish Hatchery. The transport vehicle was met at the front gate and egg tubes were removed from egg cooler and placed in a clean egg cooler containing 100-ppm Argentyne solution for 10 minutes. The clean egg cooler was then taken to the incubation room and eggs from each female were divided into two equal groups and placed in individual heath egg trays. Each tray was incubated on separate water sources.

Adult Chinook Collection

Red River

The weir and trap were put into operation on June 12, 1995 and taken out of operation September 5, 1995. A total of four fish was trapped, one adult female, two jacks and one jill (Appendices K1, K2 and K3). Water flow through the trap for adult attraction and adult holding pond is 5 cfs.

One jack and one jill were held until ripe and released directly from the trap above the weir to spawn naturally. One jack and one adult female were ponded and held for spawning. Pre-spawning mortality was zero (Appendix L).

Age class breakdown of this run was two three-year-old males, one five-year-old female and one five-year-old female. The age class breakdown was as follows: less than 25 inches (64cm) were jacks, more than 25 inches (64cm) to 32 inches (82cm) were four-year-olds and 32 inches (82cm) and over were five-year-olds. The breakdown is from limited historic CWT data from Ron Lindlund and Rodney Duke (Appendices K3, L and M).

Holding and Spawning

All spring chinook salmon adults were injected with Erythromycin 200 at a rate of 20 mg/kg to inhibit BKD. A dosage rate table developed at the University of Idaho determined erythromycin injections.

Fish being held for spawning were treated every other day with 100-ppm formalin drip for one hour. After the first sort, all fish were treated every day with 100-ppm formalin drip until spawning was complete. Females were checked for ripeness two days per week. The first female was ripe and spawned on August 15. Eggs from each female were first spawned into a colander and drained of ovarian fluid then split into five groups. Each group was fertilized with either one or two jacks for a minimum ratio of five jacks per female. The Crooked River jacks along with the Red River jack were used to fertilize eggs from the Red River female.

Eggs were water hardened in 100-ppm Argentyne solution for one hour. After one hour, eggs were rinsed, chilled, and transferred to the main facility. At the Clearwater Hatchery, eggs were disinfected in 200-ppm Argentyne for 15 minutes, tempered to ambient incubation temperature (42 to 44^{o}F), and split in two egg trays. Each tray was incubated on a separate water supply. (Appendix G for individual egg take numbers).

Kidney and ovarian tissue samples were collected at the time of spawning. These samples were air mailed the next day to the Eagle Fish Health Lab for BKD and virus testing. All carcasses were hauled to local landfill as per INAD protocol.

Egg Transport

After water hardening at the adult facility green eggs were transported to Clearwater Fish Hatchery. The transport vehicle was met at the front gate and egg tubes were removed from egg cooler and placed in a clean egg cooler containing 100-ppm Argentyne solution for 10 minutes. The clean egg cooler was then taken to the incubation room and eggs from each female were divided into two equal groups and placed in individual heath egg trays. Each tray was incubated on separate water sources.

Rapid River

Spawning

During the 1995 spawning seasons, eyed eggs from high BKD parentage were received from Rapid River Hatchery, in Riggins, Idaho. Clearwater Fish Hatchery received a total of 16,402 eyed eggs (Appendix G).

Clearwater Hatchery

Incubation

Fertilized eggs from spring chinook salmon spawned at Powell, Red River, and eyed eggs from Rapid River (Rapid River stock) were transported to Clearwater Hatchery for incubation. All fertilized eggs were transported in individual egg tubes to Clearwater Hatchery. The transport vehicle was met at the front gate and egg tubes were removed from egg coolers and placed in clean egg coolers containing 100-ppm Argentyne solution for ten minutes. The clean egg coolers were then taken to the incubation room and eggs were divided and placed into heath egg trays with one or female per two trays. All heath stacks were operated at approximately 5.5 gallons per minute. This practice was used to avoid losing all fish from one stock if some type of accident would occur during incubation.

A total of 5,259 green eggs were incubated from Powell stock, 4,376 green eggs from Red River stock and 16,402 eyed eggs from Rapid River high BKD stock.

A total of 9,635 green eggs were incubated from BY-95 spring chinook salmon. Overall eyed-eggs numbered 7,130 for a total eye-up percentage of 74%. Powell achieved a 76.4% eye-up and Red River 71.1% eye-up.

Beginning on the fourth day of incubation, all egg lots were treated with formalin to reduce fungal development. Treatments were administered three times per week at a 1:600 concentration (1667 ppm) for 15 minutes and continued until each egg lot accumulated 800 thermal units (T.U.'s).

Eye-up occurred at approximately 500 T.U.'s at which time all egg lots were shocked, picked, and enumerated by hand. The egg trays and screens were pressure washed and clean before any eyed-eggs were placed back in them for final incubating.

Prior to hatching all eyed-eggs were picked a second time. The second pick occurred at approximately 700 T.U.'s. Hatching occurred at approximately 1,000 T.U.'s at which time all egg lots were picked a third time. All trays received a fourth and a final pick at 1,700 T.U.'s to remove any dead yolk-sac fry. Swim-up fry were transferred to the early rearing vats at approximately 1,750 T.U.'s. Survival of green eggs to swim-up fries averaged 71.4%.

Both females tested positive for BKD. The Red River sample was “Low” and Powell was “moderate.”

Early Rearing Procedures

At swim-up, fry were moved to hatchery vats. The practice of rearing the fry from each of the two females is to evenly divided groups throughout the rearing cycle. This was done to protect from losing an entire stock of fish due to an accident. Vat loading was approximately 1,500 to 4,000 fish per vat. Survival from eyed egg to swim-up was 6,953 fish (97.5%). This percentage does not include the Rapid River or Selway stocks. Fish were started in a half vat with baffles in place. Initial water flows were set at 46 gallons per minute for approximately 10 days to start the fry on feed. Water flows were increased to 92 gallons per minute on day 11 and remained set at

that rate until the fish were released. Flow indices were held at or below 0.9 while DI never exceeded 0.2 during the entire early rearing period.

A total of 21,498 spring chinook were ad fin-clipped then returned to the same early rearing vats for final rearing. All chinook were between 26 and 41 fish per pound when marked in November.

No significant fish mortalities occurred during early rearing. There was some drop-off of cripples and "pinheads" during the first few months.

Water temperatures for the early rearing period ranged from 57 to 37^{o} F. Whenever the water temperatures exceeded 52^{o}F for more than two days, we cooled the water temperature by adding more secondary water (Appendix A1).

Bioproduct starter and Biodiet grower formula were used to feed all lots of fish during early rearing. A total of 1,440 pounds of food was used at a cost of $1,182.43 The conversion rate of this period was 2.27 pounds of feed for one pound of gain.

Final Rearing Procedures

All final rearing took place in the early rearing vats.

All spring chinook salmon were reared to full term smolts at Clearwater Hatchery and received two 28 days medicated feed treatments during final rearing. These feedings occurred in January and August 1996. The fish were fed Bioproducts feed with 2.25% Aquamycin-100. The fish were fed between 75 and 150 mg Erythromycin per kilogram to comply with Investigational New Animal Drug (INAD) specifications.

Bioproducts' Biodiet grower feed was the diet used throughout the final rearing period. A total of 2,444 pounds of fish food was used during final rearing at a cost of $2,006.77. Total feed used in early and final rearing was 3,884 pounds at a cost of $3,189.20 (a conversion rate of 3.06). Percent body weights fed ranged from 1.5 to 6.0 percent (Appendix N).

Chinook were fed full rations until July. At that time, most chinook salmon were fed a week-on, week-off feeding programs in July and September, and five days on and two days off from October through December. Fish were fed continuously during the weeks of medicated feed treatments in June and August. This feed regime was done to slow growth, yet maintain fin quality and fat reserves. No effects from this were detected, and fin quality and fat reserves remained excellent. This program worked well at minimizing fish size but caused poor feed conversions as a result.

Water temperatures during the final rearing period were kept as cool as possible to reduce growth rates. Every effort was made to stay below 55EF. Water from early rearing (primary) and incubation (secondary) pipelines were mixed to achieve cool temperatures (Appendix A1 and A2). Hatchery water temperatures varied from 37 to 57^{o}F during the final rearing period. An estimated 92 gpm of water supplied each raceway.

Fish Health

Diseases Encountered and Treatment. The Clearwater Hatchery applied two 28-day prophylactic feed treatments to all chinook stocks, target dose 100 mg/Kg/day.

Organosomatic Index. (Appendices O1, O2 and O3).

Acute loses. Acute losses were not experienced at this facility.

Other Assessments A fall rearing program was not implemented at the satellite facilities. Thus, there was not a requirement to sample at these facilities. Data accumulated by the Clearwater staff demonstrated that Department hatcheries can make fish that return and contribute to the fishery out of High BKD segregation groups. Early data on the natural rearing experiments, or our concept of trying to achieve this in our hatcheries, indicate that natural rearing may be detrimental to survival. Through sound fish culture practices, the Clearwater Hatchery has the opportunity to produce yearly sport fisheries on Chinook in the Clearwater drainage. The implementation of an integrated husbandry and fish health program has begun to pay dividends. The treatment appeared to be successful.

Fish Marking

All Brood Year 1995 spring chinook released from Clearwater Hatchery were marked with an adipose fin (AD) removal. No fish received coded-wire tags (CWT), 500 received Passive Integrated Transponder (PIT's). A total of 500 Red River stock received PIT's and 500 Powell stock received 500 PIT's. All Rapid River stock received AD fin clips and 500 PIT's (Appendix P).

Fish Distribution

Full term smolt: A total of 2,983 smolts were released from the Red River facility. These fish were transported to Red River on March 31 and released after a 15-day acclimation period on April 14, 1997. Also on March 31, 3,549 smolts were transported to the Powell rearing pond for a two-week acclimation and released on April 15, 1997. On April 15, 13,470 Rapid River stock were transported to Riggins (Appendix Q). There is a difference between the number of eggs received and number of fish released. The eyed egg numbers were an estimate, which was less than the number actually received. The release number was from a hand count provided by Rodney Duke's marking crew.

BROOD YEAR 1996 STEELHEAD REPORT

ABSTRACT

Clearwater Hatchery received 788,611 eyed BY-96 North Fork B-run steelhead eggs from Dworshak National Fish Hatchery (DNFH). A total of 604,936 smolts from the North Fork stock were released from April 28 through April 30, 1997; 421,030 at Red House hole, 178,912 at Kooskia Hatchery on Clear Creek and 4,991 at Red River near Soda Creek. Also, 48,370 North Fork stock parr were released on September 9, 1996 into the South Fork of Red River. The size

of fish at release for the one year rearing cycle was 5.81 fish per pound, for a total of 104,091 pounds and average length was 198 mm.

Final numbers for the BY-95 Selway / North Fork were 76,008 fish at 5.64 fish per pound; for a total of 13,477 pounds and average length of 8.00 inches. These fish were raised on a two-year rearing cycle and released in Crooked River.

A total of 178,186 pounds of feed was fed (115,380 Rangen, 62,806 Bioproducts) with a cost of $83,866.28 to produce 117,568 pounds of fish at Clearwater Hatchery. The conversion rate was 1.52.

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Clearwater

Synoptic History

Brood Source

Dworshak National Fish Hatchery was the source for North Fork stock B-run steelhead eggs.

Disease History

Dworshak Hatchery has a long history of Infectious Hematopoietic Necrosis Virus (IHNV). Therefore, Clearwater Hatchery only accepts steelhead eggs from IHNV-negative females and follows a strict disinfection protocol when transporting them onto the station.

Spawning

Dworshak BY-96 North Fork Stock: When eggs were being collected for Clearwater Fish Hatchery at DNFH, two to four of our crew would assist with their spawning operation. We collected and packaged all the disease samples to ship by airmail to Eagle Fish Health Lab.

Incubation

BY-95 Selway / North Fork stock: A total of 95,309 eyed eggs were received from Dworshak Hatchery on May 15 to May 20, 1995. A predetermined number of eggs were placed in each egg tray according to loading charts developed by National Biological Service (NBS).

Dworshak BY-96 North Fork stock: Eyed steelhead eggs were received from Dworshak Hatchery on April 1 to April 26, 1997 in four weekly shipments (Appendix R). The eggs from DNFH lots seven (March 12) through 11 (April 9) were incubated approximately 17 days at Dworshak until the eggs were eyed-up. All eggs from negative IHNV females were disinfected and transported to Clearwater Fish Hatchery. The transport vehicle was met at the front gate and egg tubes were removed from egg coolers and placed in clean and tempered egg coolers containing 100 ppm Argentyne solution for 10 minutes. The clean egg coolers were then taken to the incubation room and eggs were placed into Heath egg trays with approximately 5,400 eggs per basket, and water flows through each stack were set at six gallons per minute. A total of 788,611 eggs were received (Appendix R).

Early Rearing Procedures

BY-95 Selway / North Fork stock: At swim-up, unfed fry were placed in vats 19 through 26 according to loading charts provided by NBS. Two of the vats were all wild, two were all hatchery and two were hatchery / wild mix and one was all wild with a wrong genotype (AB). Average fish

size at the end of early rearing was 25.2 fish per pound or 4.84 inches in length. A density indexes ranged from 0.02 to 0.17 and flow indexes ranged from 0.08 to 0.68.

Bioproduct's starter and Biodiet grower were used to feed these fish during early rearing, in which 4,964 pounds of feed were used to achieve a conversion of 1.62.

Dworshak BY-96 North Fork stock: At swim-up, unfed fry from Dworshak stock B-run steelhead were moved to vats 9 through 18, and 27 through 52 and were divided as evenly as possible (26,000 fish/vat to 30,000). The initial DI was 0.07 and FI was 0.36. Fish were held in the hatchery vats until August when they were marked and moved to ten steelhead raceways (7 through 12 east and west, 7 and 10 east were empty). Average length of the fish at the end of early rearing was 3.89 inches. The fish averaged 48 fish per pound.

Water temperatures for the early rearing period ranged from 45 to 57^{o} (Appendix A2). Whenever the temperatures exceeded 57^{o}F for more than two days, the water was cooled back down by either blending in more secondary water or by lowering the primary intake in Dworshak Reservoir. Gaining clearance too lower the intake requires 24-hour prior notice to the control room at the dam. This created some lag-time in making the adjustment. There were also times during the year when we couldn't get clearance to enter the log boom because the dam was spilling water, on these days water temperature may have exceeded 57^{o}F.

Byproduct's starter and Biodiet grower were used to feed these fish during the early rearing period, in which 21,319 pounds of feed was used to achieve a feed conversion of 1.45.

Final Rearing Procedures

Selway / North Fork BY-95 stock: The juvenile Selway / North Fork stock steelhead was moved to outside steelhead raceways one through four east and west from June 10 through June 15. The fish were given RV clips as they were moved outside. A density indexes ranged from 0.06 to 0.16 and flow indexes ranged from 0.18 and 0.40.

A total of 21,930 pounds of feed was used during final rearing to produce 13,477 pounds of fish at a cost of $7,456.20. Fish were fed week-on, week-off until approximately one month prior to release, at which time they were fed every day. The overall conversion rate from fry to smolt was 1.63.

Dworshak BY-96 North Fork Stock: The juvenile Dworshak stock B-run steelhead was moved from vats 16 through 45 to steelhead raceways 7 through 12 east and west. The move outside was done from August 19 through September 20. The move was done in conjunction with fin-clipping and CWT tagging to avoid double stressing the fish. All fin-clipping was done in eight hour shifts. Baffles were removed from vats, fish were then moved to the clipping trailers using the transfer tanks. Portions of the fish were clipped through a portable ad-clipping table. The remaining portion was loaded into 200 gallon tanks and transported to the marking trailer for fin clipping and CWT tagging (Appendix S).

The density index (DI) of the Dworshak steelhead ranged from 0.12 to 0.27, and the FI ranged from 0.42 to 0.81. These indexes were recalculated biweekly and were never allowed to exceed DI of 0.30 or FI of 1.5.

Water temperatures during final rearing period were maintained to keep temperatures as close to 58^{o}F as possible (Appendix A2). Reservoir water temperatures began to drop in late October and bottomed out in March at 37^{o}F. Temperatures began to slowly increase in late April and had reached 48^{o}F by May 2 when the steelhead smolts were being stocked out. Estimated water flows per raceway was 3.2 cfs.

Fish were fed dry feed until released. A total of 134,937 pounds of feed was used during final rearing to produce 89,388 pounds of fish at a cost of $53,943.80. A total of 156,256 pounds of feed was used to produce 104,977 pounds of fish at a cost of $76,410.08. The overall conversion rate from fry to smolt was 1.49. Percent body weight fed ranged from 0.75 to 12% (Appendix N).

Fish Health

A persistent aeromonad was treated under INAD 9332 (oxytetracycline) at 10g/100 pounds of fish per day for 14 days in North Fork of the Clearwater steelhead (Appendix T). The treatment appeared to be successful.

Fish Marking

Selway / North Fork BY-95 stock: These fish received RV clips and 2,400 PIT's. All fish with RV and PIT's were released from Crooked River raceways (Appendix S).

Dworshak BY-96 North Fork Stock: North Fork stock steelhead released into the south fork of the Clearwater River, and Clear Creek were all marked with AD clips.
Of the 48,370 North Fork stock steelhead which was released into the South Fork of Red River, 4,632 received PIT's, 43,738 CWT's, and no ad-clips. Each of these groups contained a number of PIT's and CWT's (Appendix S). Another group of 4,991 fish with PIT's were released in Red River in the spring of 1997.

Fish Distribution

Selway / North Fork BY-95 stock: These fish were reared for an NBS research project. They have also been raised in two-year rearing cycles. A total of 76,008 fish were transported to Crooked River raceways for a two-week acclimation period and then released. The fish released at Crooked River were an average of 203mm 5.64 fish per pound, for a total of 13,477 pounds (Appendis S).

A shipment of Brood Year 1995 Selway / North Fork stock steelhead were transported to the NBS in Seattle, Washington. There were 150 BY-95 fish in this shipment.

Dworshak BY-96 North Fork stock: Between April 28 and April 30, a total of 421,030 Dworshak B-run steelhead were direct released at one plant site on the lower South Fork of Clearwater River. These fish were 5.6 per pound and released Red House Hole (approximately 3.5 miles upstream of Highway 14 junction). The traditional three release sites were combined to Red House Hole because of problems at Stites and Cottonwood Creek. There were problems with trucks getting stuck and poor release conditions for the smolts. The remaining 178,912 (6.4/lb) Dworshak B-run steelhead was direct released into Clear Creek at Kooskia Hatchery on the Middle Fork of the Clearwater River. There were 4,991 fish released at Red River, which averaged 173mm and 9.0 fish per pound, for a total of 555 pounds. There were very little crowding and hauling mortality from the fish transportation to the release sites (Appendix S).

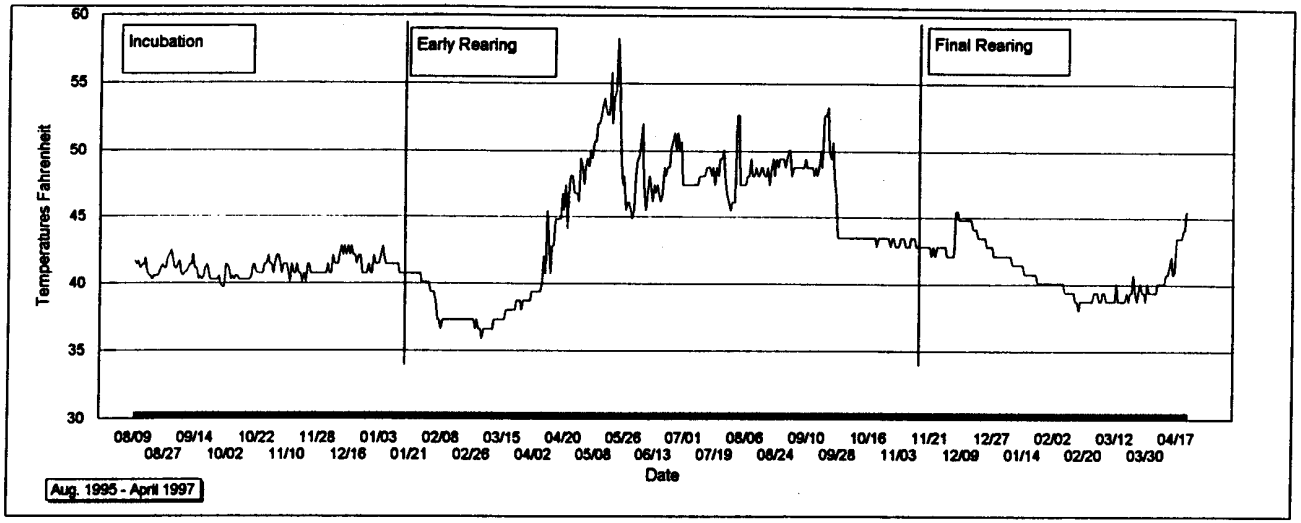
ACKNOWLEDGMENTS

The Clearwater Hatchery has a crew of 27 people and are all assigned a wide diversity of responsibilities. Everyone on station has contributed to the success of the program. The hatchery crew consists of; Jerry McGehee (Hatchery Manager), Brad George, Scott Patterson (Assistant Hatchery Manager's), John Rankin, CalLee Davenport and Marc Arms (Fish Culturist), Ernie Yost (Utility Craftsman), Rene'e Hedrick (Office Secretary), Jim Niles, Ric Downing and Chris Shockman (Fish Technicians), Art Butts, Theresa Elliott, Jeff Houck, Josh Jones, Damon Keen, Randy Martinez, Jared Yost, John Zakrajsek and David Zimmerman (Bio-aides), Dave Rising (Grounds Maintenance Worker) and Tony Demitter, Josh Downing (Laborers), Chris Estrada (Assistant Mechanic) and three Clearwater River Youth Program teenagers.

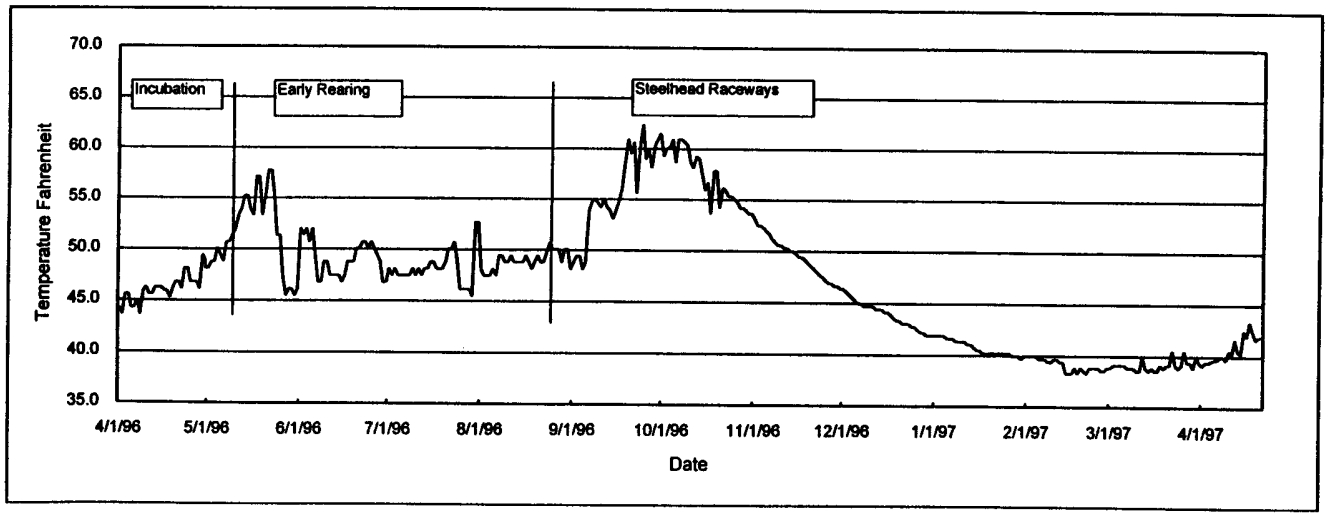
I would like to express special acknowledgment for Rene=e Hedrick for her timely manner of typing each edit of this report and her persistence to complete this project on time. Also, for Scott Patterson for his assistance in editing and generating numbers from historic data. I would also like to express special acknowledgment to Ernie Yost, Utility Craftsman; Jim Niles, Fishery Technician and Tony Demitter, Laborer for their efforts to assure the hatchery facilities and equipment were kept presentable and in top operating condition.

APPENDICES

Appendix A1. Water Temperatures, Brood Year 1995 Chinook.
*chinook stayed in early rearing area until release

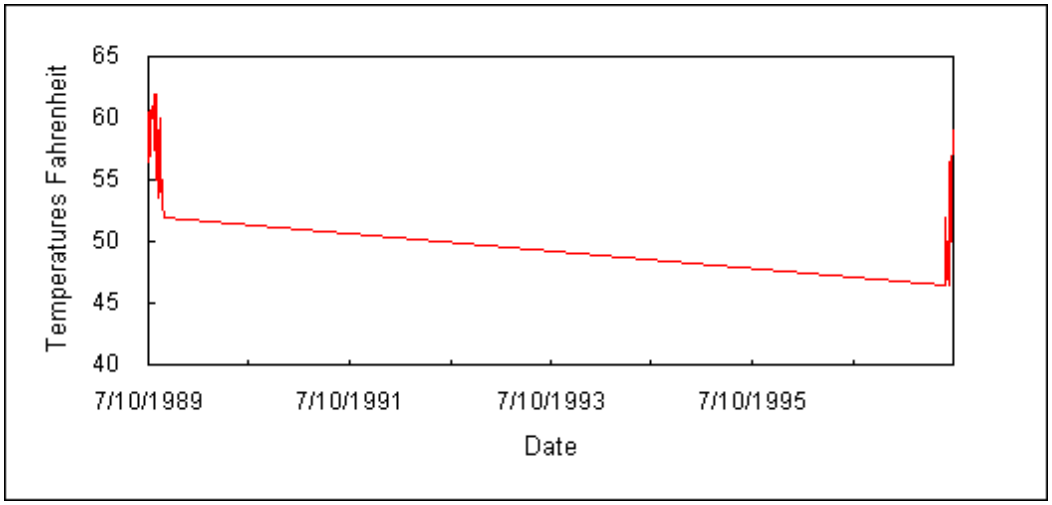


Appendix A/2 Water temperatures for Brood Year 1996 steelhead.

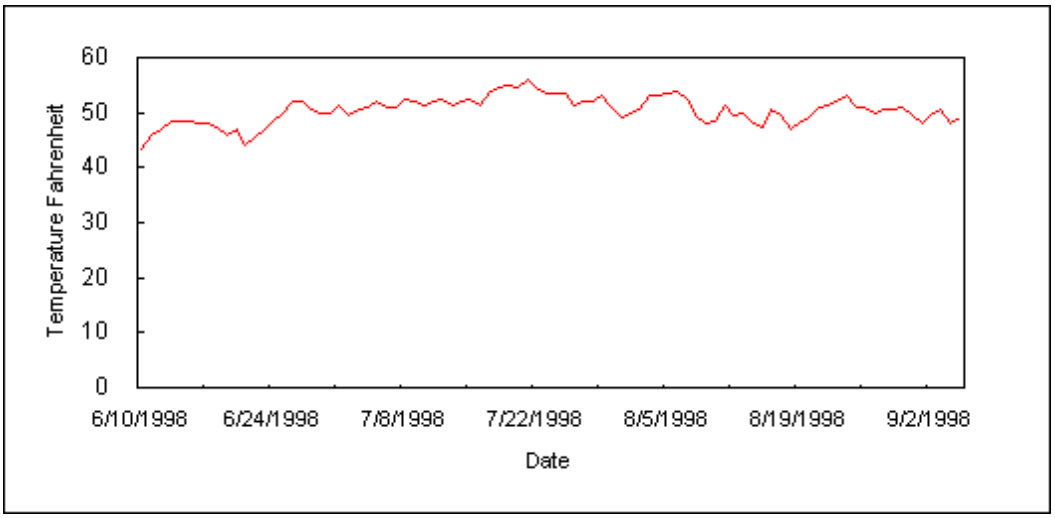


Clear 95.

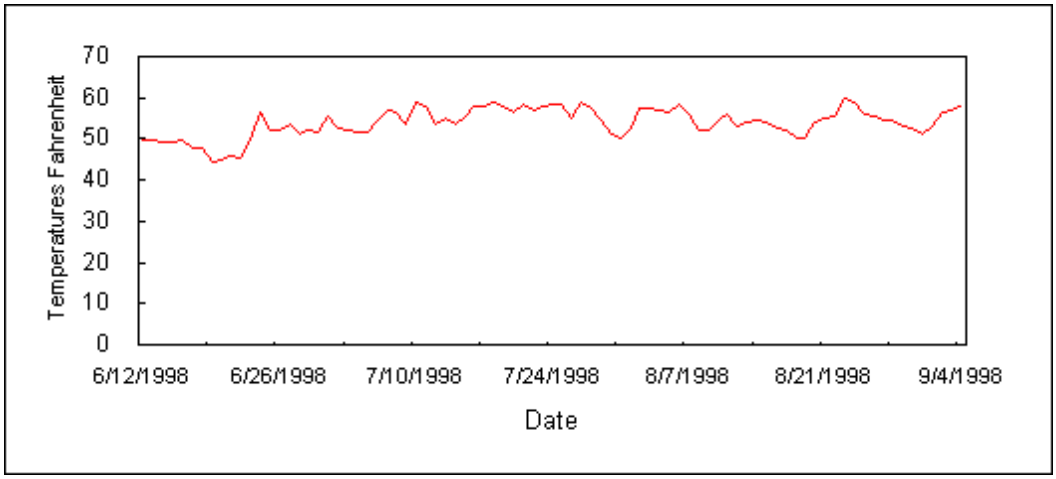
Appendix B1. Crooked River Water Temperatures 1995.



Appendix B.2 Powell water temperatures 1995.



Appendix B.3 Red River water temperatures 1995.



Appendix C1. Clearwater Hatchery Water Quality Analysis Taken From The Hatchery Rearing Facility On August 4, 1994.

Analysis	Results (Mg/L)	Date Analyzed	Optimal Rearing Levels
Alkalinity	16.0	08/04/94	120 - 400 mg/l
Ammonia (as N)	<0.005	08/04/94	0.0125
Arsenic	<0.01	08/04/94	N/A
Barium	<0.1	08/04/94	N/A
Cadmium	<0.001	08/04/94	<.0004 mg/l
Calcium	3.8	08/12/94	N/A
Chloride	0.9	08/12/94	N/A
Chromium	<0.01	08/04/94	0.1
Color (C.U.)	15	08/12/94	N/A
Copper	<0.02	08/04/94	<.006 mg/l
Cyanide	<0.005	08/12/94	N/A
Detergents(surfactant	<0.08	08/09/94	N/A
Fluoride	<0.1	08/30/94	N/A
Hardness	14.0	08/04/94	120 - 400 mg/l
Hydrogen Sulfide	<0.01	08/15/94	N/A
Iron	<0.02	08/11/94	N/A
Lead	<0.005	08/04/94	<.03 mg/l
Magnesium	<0.8	08/11/94	N/A
Manganese	<0.01	08/11/94	N/A
Mercury	<0.0005	08/11/94	<.002 mg/l
Nitrogen Nitrate	<0.013	08/18/94	0.2 mg/l
Potassium	0.5	08/12/94	N/A
Selenium	<0.005	08/10/94	N/A
Silica	11	08/30/94	N/A
Silver	<0.001	08/17/94	N/A
Sodium	1.5	08/17/94	N/A
Sulfate	<1	08/26/94	N/A
Total DissolvedSolids	28	08/11/94	80 mg /l
Zinc	<0.005	08/10/94	0.03 mg/l
pH (pH units)	7.20	08/09/94	6.5 - 8.0

Appendix C.2 Crooked River Water Quality Analysis Taken From The Rearing Intake On July 14, 1994.

Analysis	Results (Mg/L)	Date Analyzed	Optimal Rearing Levels
Alkalinity	15.0	07/29/94	120 - 400 mg/l
Aluminum	0.2	08/04/94	N/A
Ammonia	0.61	08/04/94	0.0125 mg / l
Arsenic	<0.01	08/04/94	N/A
Barium	<0.1	08/01/94	N/A
Cadmium	<0.001	08/02/94	<.0004 mg/l
Calcium	3.2	08/04/94	N/A
Chloride	0.9	07/22/94	N/A
Chromium	<0.01	07/27/94	N/A
Color (C.U.)	15	07/28/94	N/A
Copper	<0.02	08/01/94	<.006 mg/l
Cyanide	<0.005	07/27/94	N/A
Detergents(surfactant	<0.08	08/08/94	N/A
Total dissolved solids	38	07/25/94	N/A
Fluoride	<0.1	07/28/94	N/A
Hardness	14.0	08/04/94	120 - 400 mg/l
Hydrogen Sulfide	<0.010	07/26/94	N/A
Lead	<.0005	08/02/94	<.03 mg/l
Magnesium	<0.06	08/11/94	N/A
Manganese	<0.60	08/01/94	N/A
Mercury	<0.0005	08/04/94	<.002 mg/l
Nitrogen	0.13	08/04/94	0.03-.0.06
Potassium	0.4	08/12/94	N/A
Selenium	<.005	08/01/94	N/A
Silica	14.6	08/30/94	N/A
Silver	<.001	08/01/94	N/A
Sodium	2.4	08/01/94	N/A
Sulfate	<1	07/29/94	N/A
Zinc	<.005	08/01/94	0.03 mg/l
pH (pH units)	7.37	08/09/94	6.5 - 8.0

Appendix C.3 Powell Facility Water Quality Analysis Taken From The Intake Rearing On July 27, 1994.

Analysis	Results (Mg/L)	Date Analyzed	Optimal Rearing Levels
Alkalinity	24.0	07/29/94	120 - 400 mg/l
Aluminum	0.1	08/04/94	N/A
Ammonia	0.047	08/04/94	0.0125 mg / l
Arsenic	<0.01	08/04/94	N/A
Barium	<0.1	08/01/94	N/A
Cadmium	<0.001	08/02/94	<.0004 mg/l
Calcium	6.3	08/04/94	N/A
Chloride	1.1	07/22/94	N/A
Chromium	<0.01	07/27/94	N/A
Color (C.U.)	15	07/28/94	N/A
Copper	<.02	08/01/94	<.006 mg/l
Cyanide	<0.005	07/27/94	N/A
Detergents(surfactant	<0.08	08/08/94	N/A
Total dissolved solids	37	07/25/94	N/A
Fluoride	<0.1	07/28/94	N/A
Hardness	22.0	08/04/94	120 - 400 mg/l
Hydrogen Sulfide	<0.016	07/26/94	N/A
Lead	<0.0055	08/02/94	<.03 mg/l
Magnesium	<1.1	08/11/94	N/A
Manganese	<0.10	08/01/94	N/A
Mercury	<0.005	08/04/94	<.002 mg/l
Nitrogen	0.043	08/04/94	0.03-.0.06
Potassium	0.5	08/12/94	N/A
Selenium	<.005	08/01/94	N/A
Silica	15	08/30/94	N/A
Silver	<.001	08/01/94	N/A
Sodium	2.2	08/01/94	N/A
Sulfate	<1	07/29/94	N/A
Zinc	<.005	08/01/94	0.03 mg/l
pH (pH units)	7.33	08/09/94	6.5 - 8.0

A positive Langlier index indicates a tendency of water to deposit calcium carbonate and a negative index indicates a tendency to dissolve calcium carbonate. This index is not related directly to corrosion but to the deposition of a thin coherent scale which may be protective. Therefore, a slightly positive index is frequently associated with non-corrosive conditions and a negative index indicates the possibility of corrosion.

Appendix C.4. Red River Facility Water Quality Analysis Taken From The Rearing Intake On July 20, 1994.

Analysis	Results (Mg/L)	Date Analyzed	Optimal Rearing Levels
Alkalinity	16.0	07/29/94	120 - 400 mg/l
Aluminum	100 ug/l	08/04/94	N/A
Ammonia	0.016 ug/l	08/04/94	0.0125 mg / l
Arsenic	<10 ug/l	08/04/94	N/A
Barium	<100 ug/l	08/01/94	N/A
Cadmium	<1 ug/l	08/02/94	<.0004 mg/l
Calcium	3.0	08/04/94	N/A
Chloride	1.1	08/05/94	N/A
Chromium	<10	08/03/94	0.1
Color (C.U.)	15 c.u.	07/28/94	N/A
Copper	<20 ug/l	08/01/94	<.006 mg/l
Cyanide	<0.005	07/27/94	N/A
Detergents(surfactant	<0.08	08/08/94	N/A
Filterable Residue	43	07/25/94	N/A
Fluoride	<0.1	07/28/94	N/A
Hardness	18.0	08/04/94	120 - 400 mg/l
Hydrogen Sulfide	<0.01	07/26/94	N/A
Iron	<170 ug/l	08/01/94	N/A
Lead	<5 ug/l	08/02/94	<.03 mg/l
Magnesium	<0.6	08/11/94	N/A
Manganese	<10	08/01/94	N/A
Mercury	<0.5 ug/l	08/04/94	<.002 mg/l
Nitrate	0.007	08/04/94	0.03-.0.06
Potassium	0.5	08/12/94	N/A
Selenium	<5 ug/l	08/01/94	N/A
Silica	17	08/30/94	N/A
Silver	<1 ug/l	08/01/94	N/A
Sodium	3.0	08/01/94	N/A
Sulfate	<1	07/29/94	N/A
Zinc	<5 ug/l	08/01/94	0.03 mg/l
pH (pH units)	7.63	08/09/94	6.5 - 8.0

Appendix D1. Crooked River Chinook Run Timing, 1995

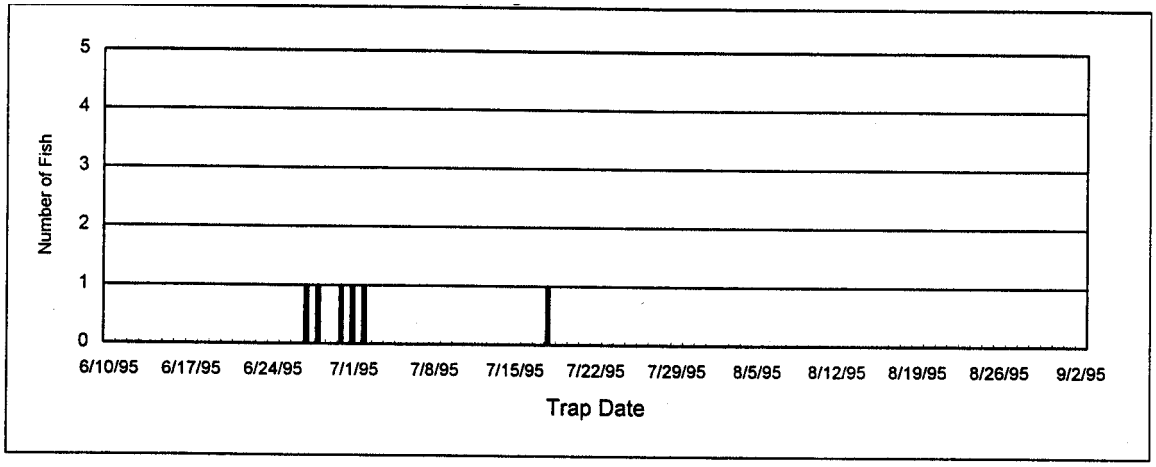
Date	Male	Female	Total Trapped
06/10	0	0	0
06/11	0	0	0
06/12	0	0	0
06/13	0	0	0
06/14	0	0	0
06/15	0	0	0
06/16	0	0	0
06/17	0	0	0
06/18	0	0	0
06/19	0	0	0
06/20	0	0	0
06/21	0	0	0
06/22	0	0	0
06/23	0	0	0
06/24	0	0	0
06/25	0	0	0
06/26	0	0	0
06/27	1	0	1
06/28	1	0	1
06/29	0	0	0
06/30	1	0	1
07/01	1	0	1
07/02	1	0	1
07/03	0	0	0
07/04	0	0	0
07/05	0	0	0
07/06	0	0	0
07/07	0	0	0
07/08	0	0	0
07/09	0	0	0
07/10	0	0	0
07/11	0	0	0
07/12	0	0	0
07/13	0	0	0
07/14	0	0	0
07/15	0	0	0
07/16	0	0	0
07/17	0	0	0
07/18	1	0	1
07/19	0	0	0
07/20	0	0	0
07/21	0	0	0
07/22	0	0	0
07/23	0	0	0
07/24	0	0	0

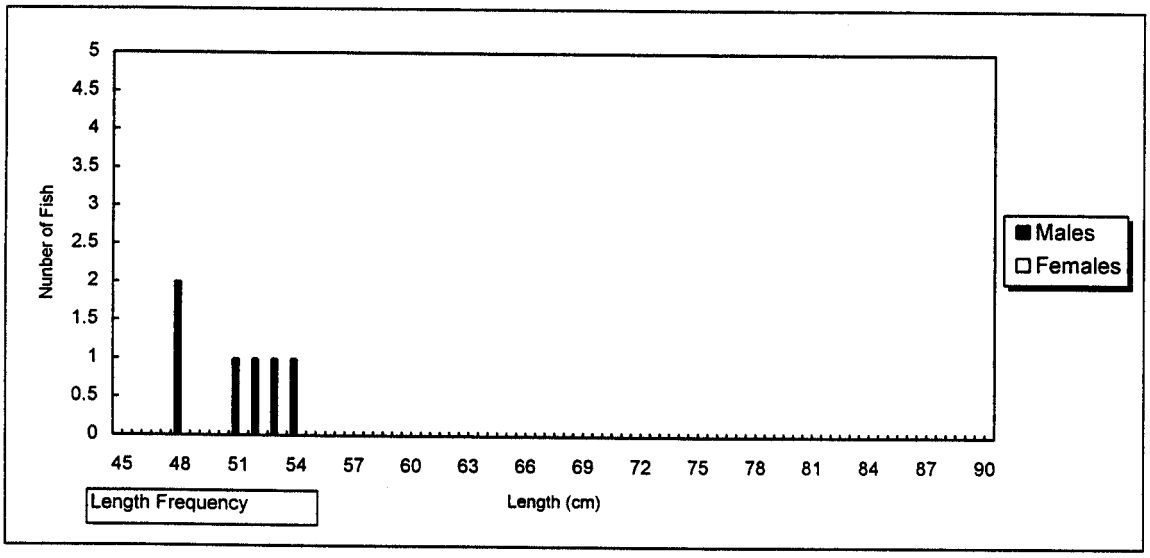
Date	Male	Female	Total Trapped
01/01	0	0	0
01/02	0	0	0
01/03	0	0	0
01/04	0	0	0
01/05	0	0	0
01/06	0	0	0
01/07	0	0	0
01/08	0	0	0
01/09	0	0	0
01/10	0	0	0
01/11	0	0	0
01/12	0	0	0
01/13	0	0	0
01/14	0	0	0
08/08	0	0	0
08/09	0	0	0
08/10	0	0	0
08/11	0	0	0
08/12	0	0	0
08/13	0	0	0
08/14	0	0	0
08/15	0	0	0
08/16	0	0	0
08/17	0	0	0
08/18	0	0	0
08/19	0	0	0
08/20	0	0	0
08/21	0	0	0
08/22	0	0	0
08/23	0	0	0
08/24	0	0	0
08/25	0	0	0
08/26	0	0	0
08/27	0	0	0
08/28	0	0	0
08/29	0	0	0
08/30	0	0	0
08/31	0	0	0
09/01	0	0	0
09/02	0	0	0
09/03	0	0	0
09/04	0	0	0
09/05	0	0	0
Totals	0	0	0

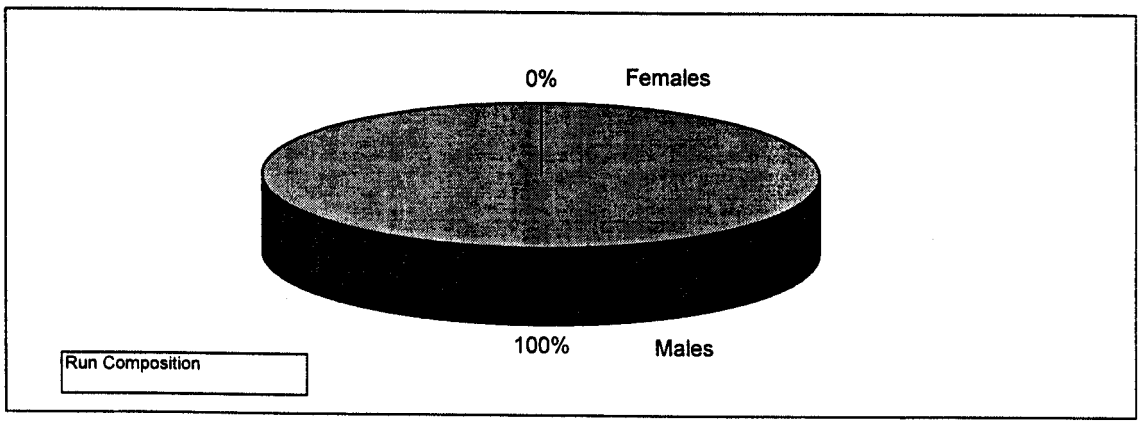
Appendix D2. Crooked River chinook length frequency 1995.

Size (CM)	Male	Female	Total Trapped
45	0	0	0
46	0	0	0
47	0	0	0
48	2	0	2
49	0	0	0
50	0	0	0
51	1	0	1
52	1	0	1
53	1	0	1
54	1	0	1
55	0	0	0
56	0	0	0
57	0	0	0
58	0	0	0
59	0	0	0
60	0	0	0
61	0	0	0
62	0	0	0
63	0	0	0
64	0	0	0
65	0	0	0
66	0	0	0
67	0	0	0
68	0	0	0
69	0	0	0
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	0	0
75	0	0	0
76	0	0	0
77	0	0	0
78	0	0	0
79	0	0	0
80	0	0	0
81	0	0	0
82	0	0	0
83	0	0	0
84	0	0	0
85	0	0	0
86	0	0	0
87	0	0	0
88	0	0	0
89	0	0	0
90	0	0	0
Total	6	0	6

Appendix D3. Crooked River chinook trapping 1995.







Appendix E. Crooked River Chinook Summary Of Fish Trapped, Released, Spawned, And Disposition Of Carcasses, Brood Year 1995.

Total Fish Trapped:	6

Age Classes	Females	Males
3 Years = (<64 cm)	0	6
4 Years = (64 - 82 cm)	0	0
5 Years = (> 83 cm)	0	0
Totals	0	6

Fish Disposition Females:		
Spawned	0	Adult
Released	0	Adult
Mortality	0	Adult
Total	0	

Fish Disposition Males:		
Spawned	0	Adult
Released	0	Adult
Mortality	0	Adult
Total	0	

All spawning carcasses were hauled to local landfill as per INAD protocol

Appendix F. Summary Of Spring Chinook Returns To Crooked River By Brood Year

Brood year	Year released	Number released	3-yr olds	Year returned	4-yr olds	Year returned	5-yr olds	Year returned	Total BY return	% return from plant
1985	----	----	----	1988	----	1989	4	1990	4	ERR
1986	----	----	----	1989	23	1990	5	1991	28	ERR
1987	Spr 1989[a]	199,700	2	1990	13	1991	7	1992	22	0.011%
1988	Spr 1990[b]	300,407	2	1991	208	1992	276	1993	486	0.162%
1989	Fall 1990[c]	339,087	13	1992	119	1993	10	1994	142	0.042%
1990	Fall 1991[a]	320,400	7	1993	15	1994	0	1995	22	0.002%
1991	----	----	1*	1994	0	1995	1	1996	1	0.000%
1992	Spr 1994[d]	273,766	6	1995	241[G]	1996		1997		0.002%
1993	Fall 1994	199,255								
	Fall 1994[e]	216,280	94[g]	1996		1997		1998	0	0.000%
	Spr 1995	258,293								
	Spr 1995[f]	279,615								
		953,443								
1994	Spr 1996	37,071		1997		1998		1999		
1994	Spr 1997		0	1998		1999		2000		

[a]Transferred from Dworshak Hatchery.
[b]Direct release from Kooskia Fish Hatchery.
[c]Transferred from Dworshak and Rapid River hatcheries.
[d]Eggs from Looking Glass Hatchery (Rapid River stock) reared at Clearwater Hatchery
[e]Eggs from Rapid River hatchery reared at Clearwater Hatchery
[f]Non-acclimated release
[g]These numbers do not match run report numbers. Each one has been corrected to reflect straying from other stocks.
*Natural Fish

Appendix G. Clearwater Hatchery Spring Chinook Egg Inventory Information, Brood Year 1995. Sources Of Eggs Are Shown.

Powell

Lot Number	Date Spawned	Number Of Females	Net Egg Numbers	Eggs Per Female	Number Eyed Eggs	Percent Eye-Up
1	August 21	1	5,259	5,259	4,020	76.4
Totals		1	5,259	5,259	4,020	76.4

Red River

Lot Number	Date Spawned	Number Of Females	Net Egg Numbers	Eggs Per Female	Number Eyed Eggs	Percent Eye-Up
1	August 15	1	4,376	4,376	3,110	71.1
Totals		1	4,376	4,376	3,110	71.1

Rapid River

Lot Number	Number Of Females	Number Eyed Eggs
1	3	10,363
2	2	6039
Totals	5	16402

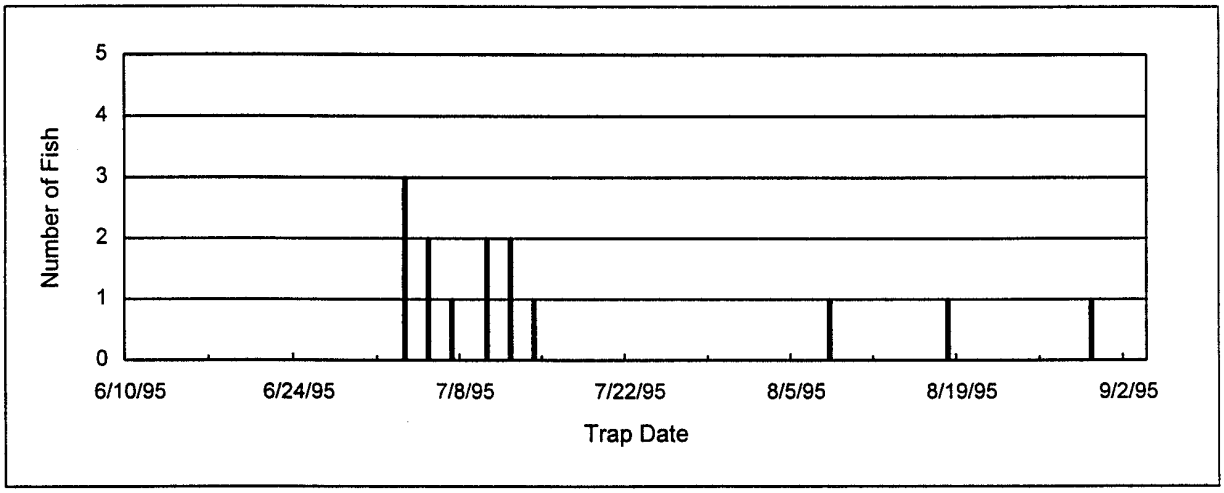
Appendix H1. Powell Chinook Run Timing 1995

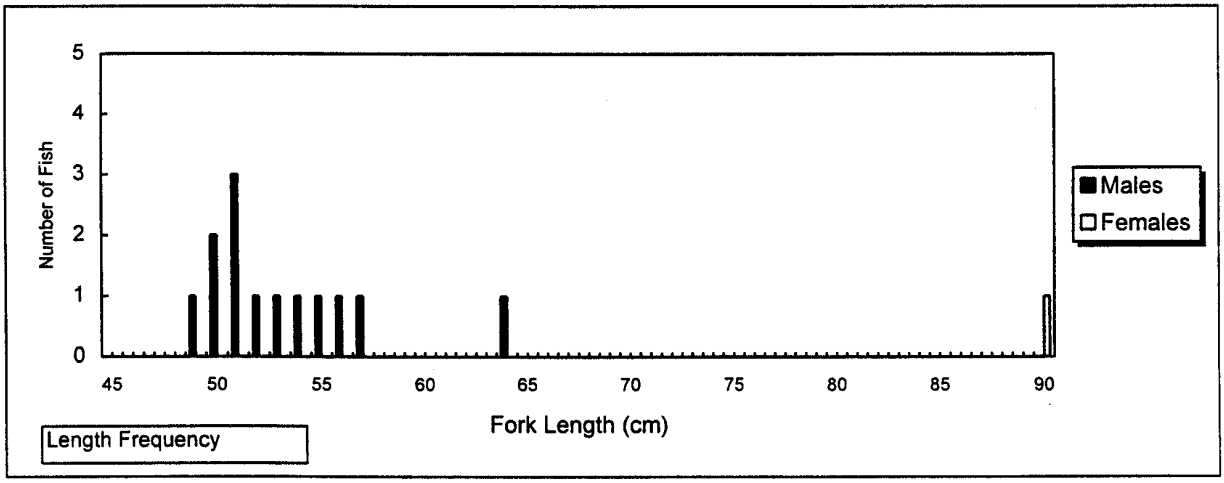
Date	Male	Female	Total Trapped
06/10	0	0	0
06/11	0	0	0
06/12	0	0	0
06/13	0	0	0
06/14	0	0	0
06/15	0	0	0
06/16	0	0	0
06/17	0	0	0
06/18	0	0	0
06/19	0	0	0
06/20	0	0	0
06/21	0	0	0
06/22	0	0	0
06/23	0	0	0
06/24	0	0	0
06/25	0	0	0
06/26	0	0	0
06/27	0	0	0
06/28	0	0	0
06/29	0	0	0
06/30	0	0	0
07/01	0	0	0
07/02	0	0	0
07/03	3	0	3
07/04	0	0	0
07/05	2	0	2
07/06	0	0	0
07/07	1	0	1
07/08	0	0	0
07/09	0	0	0
07/10	2	0	2
07/11	0	0	0
07/12	1	1	2
07/13	0	0	0
07/14	1	0	1
07/15	0	0	0
07/16	0	0	0
07/17	0	0	0
07/18	0	0	0
07/19	0	0	0
07/20	0	0	0
07/21	0	0	0
07/22	0	0	0
07/23	0	0	0
07/24	0	0	0
07/26	0	0	0
07/27	0	0	0
07/28	0	0	0
07/29	0	0	0
07/30	0	0	0
07/31	0	0	0
08/01	0	0	0
08/02	0	0	0
08/03	0	0	0
08/04	0	0	0
08/05	0	0	0
08/06	0	0	0
08/07	0	0	0
08/08	1	0	1
08/09	0	0	0
08/10	0	0	0
08/11	0	0	0
08/12	0	0	0
08/13	0	0	0
08/14	0	0	0
08/15	0	0	0
08/16	0	0	0
08/17	0	0	0
08/18	1	0	1
08/19	0	0	0
08/20	0	0	0
08/21	0	0	0
08/22	0	0	0
08/23	0	0	0
08/24	0	0	0
08/25	0	0	0
08/26	0	0	0
08/27	0	0	0
08/28	0	0	0
08/29	0	0	0
08/30	1	0	1
08/31	0	0	0
09/01	0	0	0
09/02	0	0	0
09/03	0	0	0
09/04	0	0	0
09/05	0	0	0
Totals	13	1	14

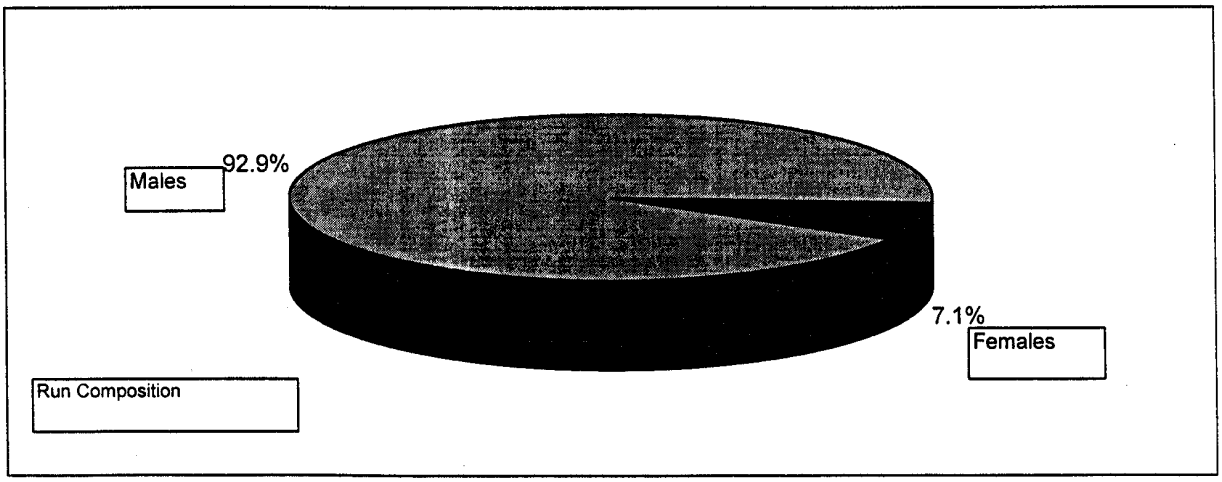
Appendix H2. Powell chinook length frequency 1995

Size (CM)	Male	Female	Total Trapped
45	0	0	0
46	0	0	0
47	0	0	0
48	0	0	0
49	1	0	1
50	2	0	2
51	3	0	3
52	1	0	1
53	1	0	1
54	1	0	1
55	1	0	1
56	1	0	1
57	1	0	1
58	0	0	0
59	0	0	0
60	0	0	0
61	0	0	0
62	0	0	0
63	0	0	0
64	1	0	1
65	0	0	0
66	0	0	0
67	0	0	0
68	0	0	0
69	0	0	0
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	0	0
75	0	0	0
76	0	0	0
77	0	0	0
78	0	0	0
79	0	0	0
80	0	0	0
81	0	0	0
82	0	0	0
83	0	0	0
84	0	0	0
85	0	0	0
86	0	0	0
87	0	0	0
88	0	0	0
89	0	0	0
90	0	1	1
Total	13	1	14

Appendix H3. Powell chinook trapping 1995







Appendix I. Crooked River Chinook Summary Of Fish Trapped, Released, Spawned, And Disposition Of Carcasses, Brood Year 1995.

Total Fish Trapped:	6

Age Classes	Females	Males
3 Years = (<64 cm)	0	12
4 Years = (64 - 82 cm)	0	1
5 Years = (> 83 cm)	1	0
Totals	1	13

Fish Disposition Females:		
Spawned	1	Adult
Released	0	Adult
Mortality	0	Adult
Total	1*	

*Female spawned with 8 jacks

Fish Disposition Males:		
Spawned	0	Adult
Released	1	Adult
Mortality	0	Adult
Total	1	

All spawning carcasses were hauled to local landfill as per INAD protocol

Appendix J. Summary Of Spring Chinook Returns To Powell By Brood Year

Brood Year	Year Released	Number Released	3-Yr Olds	Year Returned	4-Yr Olds	Year Returned	5-Yr Olds	Year Returned	Total BY Return	% Return From Plant
1984	Spr 1986	----		1987		1988	16	1989	16	ERR
1985	Spr 1987	----		1988	111	1989	20	1990	131	ERR
1986	Spr 1988[a]	200,100	27	1989	157	1990	10	1991	194	0.097%
1987	Spr 1989[b]	200,639	2	1990	16	1991	15	1992	33	0.016%
1988	Fall 1989	314,500	7	1991	249	1992	288	1993	544	0.173%
1989	Fall 1990	307,100	6	1992	204	1993	57	1994	267	0.054%
	Spr 1991[c]	180,764								
1990	Fall 1991	358,400	8	1993	28	1994	1	1995	37	0.007%
	Spr 1992[d]	150,800								
	Spr 1992[e]	53,500								
		562,700								
1991	Fall 1992[f]	500	1	1994	1	1995	0	1996	2	
	Fall 1992[g]									
1992	Spr 1994[h]	144,823	12	1995	141	1996		1997	12	0.005%
	Spr 1994[i]	61,060								
	Spr 1994[j]	55,745								
		261,628								
1993	Fall 1994	311,690	45	1996		1997		1998		
	Spr 1995	290,417								
1994	Spr 1996	232,731		1997		1998		1999		
1995	Spr 1997	3,549		1998		1999		2000		

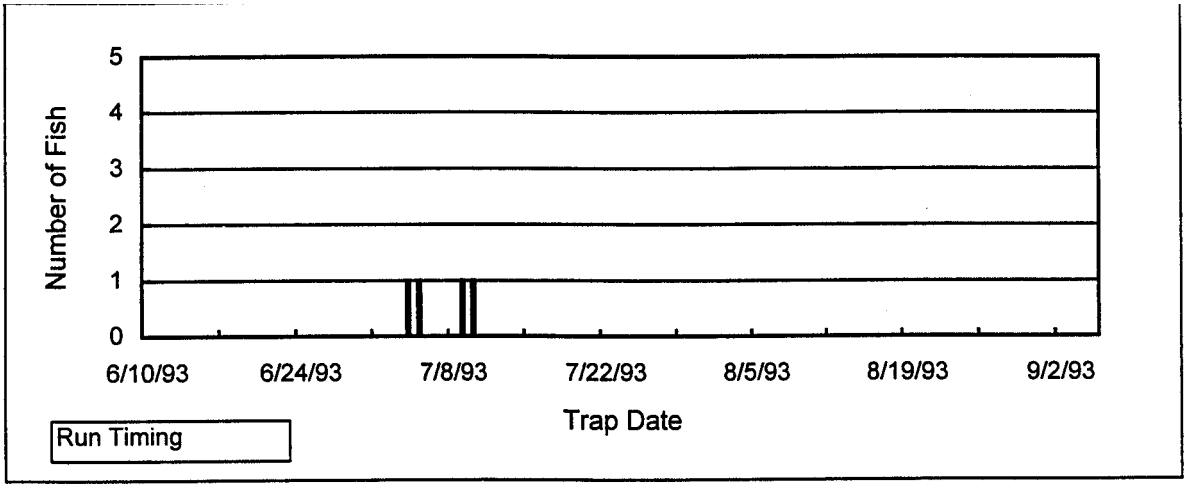
[a]Rapid River stock reared at Dworshak.
[b]Clearwater stock reared at Kooskia and Dworshak.
[c]Clearwater stock reared at Kooskia; acclimated in rearing pond.
[d]Acclimated 21 days in rearing pond before release into Walton Creek, transferred from Dworshak.
[e]Not acclimated, transferred to rearing pond and immediately released.
[f]These smolts were released from the rearing pond to Walton Creek.
[g]Released at headwaters of Crooked Fork Creek
[h]Acclimated 17 days, volitional release 5 days, release in Walton Cr.
[i]Non-acclimated, transferred to rearing pond and immediately released.
[j]Released directly into Walton Creek

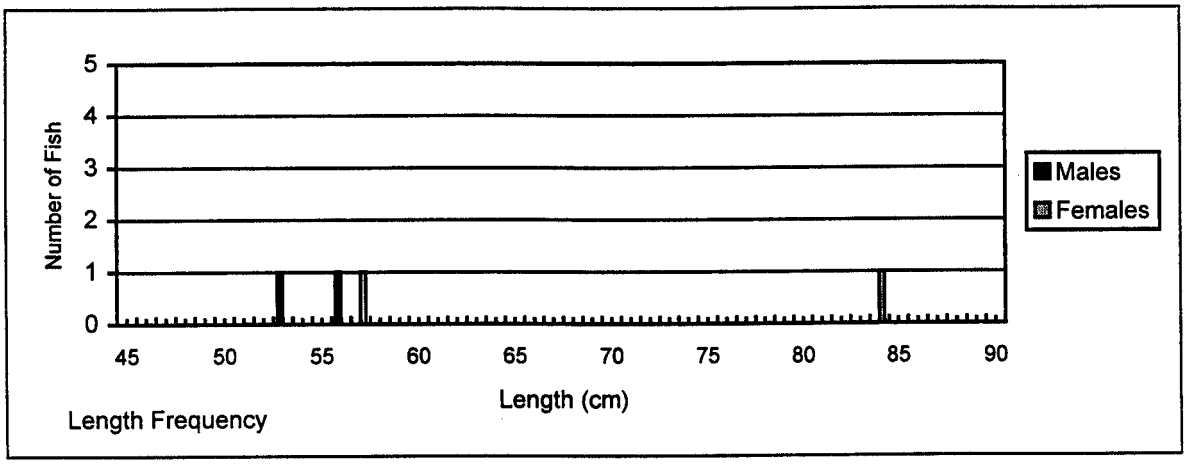
Appendix K1. Red River Chinook Run Timing, 1995

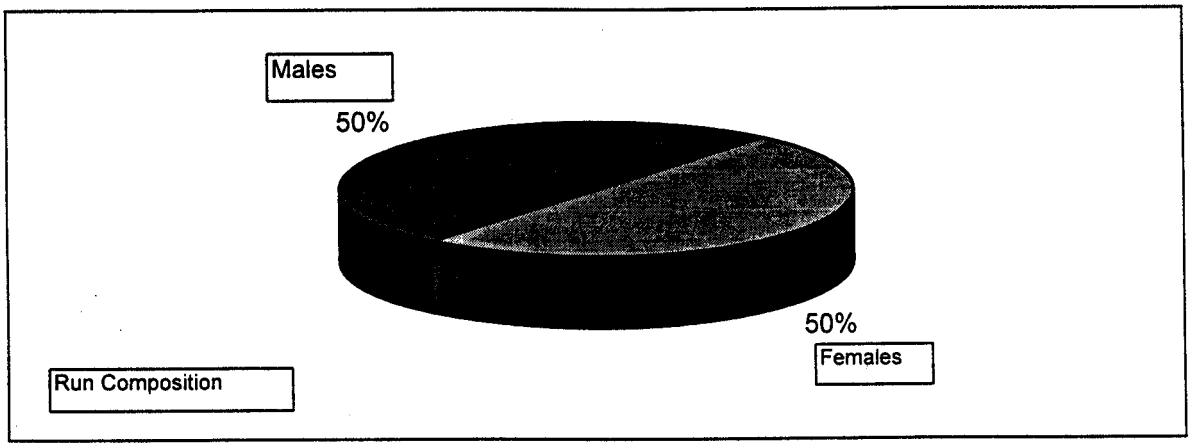
Date	Male	Female	Total Trapped
06/10	0	0	0
06/11	0	0	0
06/12	0	0	0
06/13	0	0	0
06/14	0	0	0
06/15	0	0	0
06/16	0	0	0
06/17	0	0	0
06/18	0	0	0
06/19	0	0	0
06/20	0	0	0
06/21	0	0	0
06/22	0	0	0
06/23	0	0	0
06/24	0	0	0
06/25	0	0	0
06/26	0	0	0
06/27	0	0	0
06/28	0	0	0
06/29	0	0	0
06/30	0	0	0
07/01	0	0	0
07/02	0	0	0
07/03	0	0	0
07/04	1	0	1
07/05	0	0	0
07/06	0	1	1
07/07	0	0	0
07/08	0	0	0
07/09	1	0	1
07/10	0	1	1
07/11	0	0	0
07/12	0	0	0
07/13	0	0	0
07/14	0	0	0
07/15	0	0	0
07/16	0	0	0
07/17	0	0	0
07/18	0	0	0
07/19	0	0	0
07/20	0	0	0
07/21	0	0	0
07/22	0	0	0
07/23	0	0	0
07/24	0	0	0
07/26	0	0	0
07/27	0	0	0
07/28	0	0	0
07/29	0	0	0
07/30	0	0	0
07/31	0	0	0
08/01	0	0	0
08/02	0	0	0
08/03	0	0	0
08/04	0	0	0
08/05	0	0	0
08/06	0	0	0
08/07	0	0	0
08/08	0	0	0
08/09	0	0	0
08/10	0	0	0
08/11	0	0	0
08/12	0	0	0
08/13	0	0	0
08/14	0	0	0
08/15	0	0	0
08/16	0	0	0
08/17	0	0	0
08/18	0	0	0
08/19	0	0	0
08/20	0	0	0
08/21	0	0	0
08/22	0	0	0
08/23	0	0	0
08/24	0	0	0
08/25	0	0	0
08/26	0	0	0
08/27	0	0	0
08/28	0	0	0
08/29	0	0	0
08/30	0	0	0
08/31	0	0	0
09/01	0	0	0
09/02	0	0	0
09/03	0	0	0
09/04	0	0	0
09/05	0	0	0
Totals	2	2	4

Appendix K2. Red River Chinook Length Frequency 1995

Size (CM)	Male	Female	Total Trapped
45	0	0	0
46	0	0	0
47	0	0	0
48	0	0	0
49	0	0	0
50	0	0	0
51	0	0	0
52	0	0	0
53	1	0	1
54	0	0	0
55	0	0	0
56	1	0	1
57	0	1	1
58	0	0	0
59	0	0	0
60	0	0	0
61	0	0	0
62	0	0	0
63	0	0	0
64	0	0	0
65	0	0	0
66	0	0	0
67	0	0	0
68	0	0	0
69	0	0	0
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	0	0
75	0	0	0
76	0	0	0
77	0	0	0
78	0	0	0
79	0	0	0
80	0	0	0
81	0	0	0
82	0	0	0
83	0	0	0
84	0	1	1
85	0	0	0
86	0	0	0
87	0	0	0
88	0	0	0
89	0	0	0
90	0	0	0
Total	2	2	4


Number of Fish
5
4
3
2
1
0
6/10/93
6/24/93
7/8/93
7/22/93
8/5/93
8/19/93
9/2/93
Trap Date
Run Timing


Number of Fish
5
4
3
2
1
0
45
50
55
60
65
70
75
80
85
90
Length (cm)
Males
Females
Length Frequency


Males
50%
50%
Females
Run Composition

Appendix L. Crooked River Chinook Summary Of Fish Trapped, Released, Spawned, And Disposition Of Carcasses, Brood Year 1995

Total Fish Trapped:	4

Age Classes	Females	Males
3 Years = (<64 cm)	1	2
4 Years = (64 - 82 cm)	0	0
5 Years = (> 83 cm)	1	0
Totals	2	2

Fish Disposition Females:		
Spawned	1	Adult
Released	0*	Adult
Mortality	0	Adult
Total	0	

Fish Disposition Males:		
Spawned	0	Adult
Released	0*	Adult
Mortality	0	Adult
Total	0	

*1 jack and 1 jill released above the weir

All spawning carcasses were hauled to local landfill as per INAD protocol

Appendix M. Summary Of Chinook Returns To Red River By Brood Year

Brood year	Year released	Number released	3-yr olds	Year returned	4-yr olds	Year returned	5-y olds	Year returned	Total BY return	% return from plant
1982	Fall 1983	260,000	2	1985	[a]	1986	107	1987	109	0.036%
	Spr 1984	40,000								
1983	Spr 1985[b]	80,000	[a]	1986	377	1987	259	1988	636	0.795%
1984	Spr 1986[b]	136,800	35	1987	132	1988	74	1989	241	0.176%
1985	Fall 1986[c]	96,400	3	1988	25	1989	13	1990	41	0.021%
	Spr 1987[c]	96,800								
1986	Fall 1987	233,100	5	1989	38	1990	8	1991	51	0.022%
1987	Fall 1988	291,200	2	1990	9	1991	3	1992	14	0.005%
1988	Fall 1989	240,500	1	1991	31	1992	391993	71	0.029%	
1989	Fall 1990	273,800	5	1992	99	1993	13	1994	117	0.025%
1989	Spr 1991[d]	63,000								
1989	Spr 1991[e]	124,000								
		460,800								
1990	Fall 1991	354,700	1	1993	18	1994	1	1995	20	0.004%
1990	Spr 1992[f]	207,500								
		562,200								
1991	Fall 1992	6,000	0	1994	0	1995	0	1996	0	0.000%
1992	Fall 1993	22,246	3	1995	4[g]	1996		1997	56	0.013%
1993	Fall 1994	320,755	5	1996		1997		1998		
1994	Spr 1996	24,002		1997		1998		1999		
1995	Spr 1997	2,983		1998		1999		2000		

[a]Trap was not installed in 1986 due to construction.
[b]These fish wintered in the rearing pond.
[c]These fish were Rapid River stock reared at Sawtooth and released directly into Red River with no acclimation.
[d]Planted off bridge at ranger station, reared at Dworshak National Fish Hatchery, Clearwater stock.
[e]Planted off bridge at ranger station, reared at Kooskia, Clearwater stock.
[f]Acclimated in rearing pond for 21 days, transferred from Dworshak.
[G]These numbers do not match run report numbers. Each one has been corrected to reflect straying from other stocks.

Appendix N. Production Cost For BY-95 Chinook, BY-95 Selway, and North Fork Steelhead and BY96 North Fork Steelhead.

Rearing To Release

	Chinook (BY-95)	Selway / North Fork (BY-95)	North Fork Steelhead (BY-96)
No. Produced	21,428	76,008	658,654
Weight	1,282	13,477	104,977
% Mortality	17.7%	20.2%	16.5%
Conversion Rate	3.06	1.63	1.49

* week on - week off feeding

Food Fed And Weight Gained

	Chinook (BY-95)	Selway / North Fork (BY-95)	North Fork Steelhead (BY-96)
Period Fed	1/24/96 - 4/15/97	6/3/95 - 4/23/97	5/13/95 - 4/25/97
Feed Used Lbs.	3,884	21,930	156,256
Weight Gain	1,282	13,477	104,977
Feed Cost	$3,189.20	$7,456.20	$76,410.08

Total Feed Cost	$87,055.48
Cost / pound steelhead and chinook	$0.72

Appendix O1. Summary Of Fish Autopsy

Summary Of Fish Autopsy

Accession No:	97-50	Location:	Clearwater Hatchery
Species:	Spring Chinookl	Autopsy Date:	03/11/97
Strain:	Powell	Age:	Juv
Unit:		Sample Size:	10
Reason For Autopsy:	Prelib		
Investigator(S):	Munson, Burton		
Remarks:			

	Mean	Standard Deviation	Coefficient Of Variation
Length	0.00	0.00	0.00
Weight	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
Hematocrit	49.20	4.76	0.09
Leucocrit	0.00	0.00	0.00
Serum Protein	00.0	0.00	0.00

*Expressed At KTL Times 10 To The Fifth Power

**Converted From KTL; Expressed As CTL Times 10 To Fourth Power

Values As Percents Of Total Sample

Eyes		Gills		Pseudo-Branchs		Thymus		Mesen. Fat		Spleen		Hind Gut		Kidney		Liver		Bile	
N	10	N	10	N	10	0	10	0	0	B	2	0	10	N	10	A	0	0	0
B1	0	F	0	S	0	1	0	1	0	R	8	1	0	S	0	B	10	1	0
B2	0	C	0	L	0	2	0	2	1	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	8	No	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	1	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=3.00								OT	0		
M1	0																		
OT	0																		

Summary Of Normals

	20	20	20	20	20	20	20	20	20	0
Sex	M: 0		F: 0		U: 0					

General Remarks:

Fins: Gonads:

Skin: Other:

Appendix O2. Summary Of Fish Autopsy

Summary Of Fish Autopsy

Accession No:	97-51	Location:	Clearwater Hatchery
Species:	Spring Chinookl	Autopsy Date:	03/11/97
Strain:	Red River	Age:	Juv
Unit:		Sample Size:	10
Reason For Autopsy:	Prelib		
Investigator(S):	Munson, Burton		
Remarks:			

	Mean	Standard Deviation	Coefficient Of Variation
Length	0.00	0.00	0.00
Weight	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
Hematocrit	48.00	1.69	0.03
Leucocrit	0.00	0.00	0.00
Serum Protein	00.0	0.00	0.00

*Expressed At KTL Times 10 To The Fifth Power

**Converted From KTL; Expressed As CTL Times 10 To Fourth Power

Values As Percents Of Total Sample

Eyes		Gills		Pseudo-Branchs		Thymus		Mesen. Fat		Spleen		Hind Gut		Kidney		Liver		Bile	
N	9	N	10	N	10	0	10	0	0	B	9	0	10	N	10	A	0	0	0
B1	1	F	0	S	0	1	0	1	0	R	1	1	0	S	0	B	10	1	0
B2	0	C	0	L	0	2	0	2	0	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	10	No				G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	6	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=3.00								OT	0		
M1	0																		
OT	0																		

Summary Of Normals

	20	20	20	20	20	20	20	20	20	0
Sex	M: 0		F: 0		U: 0					

General Remarks:

Fins: Gonads:

Skin: Other:

Appendix O3. Summary Of Fish Autopsy

Summary Of Fish Autopsy

Accession No:	97-52	Location:	Clearwater Hatchery
Species:	Spring Chinook	Autopsy Date:	03/11/97
Strain:	Red River	Age:	Juv
Unit:		Sample Size:	20
Reason For Autopsy:	Prelib		
Investigator(S):	Munson, Burton		
Remarks:			

	Mean	Standard Deviation	Coefficient Of Variation
Length	0.00	0.00	0.00
Weight	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
Hematocrit	49.84	3.85	7.00
Leucocrit	0.00	0.00	0.00
Serum Protein	00.0	0.00	0.00

*Expressed At KTL Times 10 To The Fifth Power

**Converted From KTL; Expressed As CTL Times 10 To Fourth Power

Values As Percents Of Total Sample

Eyes		Gills		Pseudo-Branchs		Thymus		Mesen. Fat		Spleen		Hind Gut		Kidney		Liver		Bile	
N	20	20	N	20	0	20	0	0	B	8	0	20	N	20	A	0	0	0	
B1	0	F	0	S	0	1	0	1	0	R	12	1	0	S	0	B	0	1	0
B2	0	C	0	L	0	2	0	2	0	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	20	No	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	0	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0						OT	0		T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=3.00								OT	0		
M1	0																		
OT	0																		

Summary Of Normals

	20	20	20	20	20	20	20	20	20	0
Sex	M: 0		F: 0		U: 0					

General Remarks:

Fins: Gonads:

Skin: Other:

Appendix P. Clearwater Hatchery BY95 spring chinook fish marking summary

Full Term Smolts

Site	Date	Mark	CWT	PIT	Number	Fpp	Length (mm)
Powell	11/20/96	AD	0	500	3,580	34.8	112
Red River	11/20/96	AD	0	500	2,955	29.6	113
Rapid River	11/21/96	AD	0	500	13,493	33.7	113
		TOTAL		1,500	20,028	32.7	

Appendix Q. Anadromous Stocking Report, Brood Year 1995

Species	Stock	Brood Year	Release Site	Release Date	Number Released	Size No./lb	Length (T.L.)			Released
Spring Chinook	Red River	1995	Red River	04/14/97	2,983	16.1	5.61	185	AD	500 PIT
Spring Chinook	Powell	1995	Powell	04/15/97	3,549	19.6	5.26	181	AD	497 PIT
Spring Chinook	Rapid River	1995	Rapid River	04/15/97	13,470	15.9	5.62	848	AD	498 PIT
			TOTAL RELEASED		20,002			1,214		

Appendix R. Brood Year 1996 Steelhead (B) Eggs Received From Dworshak National Fish Hatchery

Egg Take Number	Spawn Date	Eyed Egg Deliver Date	Number Eyed Eggs	Temperature Units
7	03/12/96	04/01/96	80,777	460
8	03/19/96	04/05/96	169,000	391
9	03/26/96	04/12/96	197,575	391
10	04/01/96	04/19/96	202,400	391
11	04/09/96	04/26/97	138,859	391
		TOTAL	788,611	

Machine enumeration done at Dworshak National Fish Hatchery.

Brood Year 96 Steel Head Survival From Eggs To Released Smolts.

Stock	#Eyed Eggs	Released Fingerlings	Percent Survival
BY-96 Dworshak B	788,611	658,654	83.5
Total		658,654	

Appendix S. Brood Year 1996, North Fork Steelhead marking and distribution

Site	Date	Mark	CWT	PIT	Number	Fpp	Length (mm)
Upper Crooked River	6/10 - 6/12/96	RV	0	2400	77319	25	123
Soda Creek (S.F. Red River)	8/21 - 8/23/96	None	43767	5000	48767	55	86
Clear Creek (Kooskia Hatchery)	8/26 - 9/20	AD / LV	133,077	1,200	133,077	48	100
So. Frk. Clearwater (Red House Hole)	8/26 - 9/20	AD	0	0	473,657	48	100
Soda Creek (N.F. Red River)	3/19 - 3/20/97	None	0	5000	5000	9	173
		TOTAL	176,844	13,600	737,820		

* PIT done in March 1997

Species	Stock	Brood Year	Release Site	Release Date	Number Released	Size No./lb	Length F.L. or T.L.	Pounds	Marks	of Marks Released
Steelhead	Selway / North Fork	95	Upper Crooked River	04/23/97	76008	5.64	8.00	13477	RV	2,385 PIT
Steelhead	North Fork	96	Soda Creek (N.F. Red River)	04/28/97	4991	9.00	6.82	555	No AD	4,991 PIT
Steelhead	North Fork	96	Soda Creek (S.F. Red River)	09/05/96	48370	55.00	4.00	886	No AD	4,992 PIT 43,738 CWT
Steelhead	North Fork	96	Clear Creek (Kooskia Hatchery)	04/28/97	178912	6.40	7.66	27976	AD	60k CWT(LV) 600 PIT
Steelhead	North Fork	96	So. Frk. Clearwater (Red House Hole)	04/28 - 04/30/97	421,030	5.60	7.99	75,560	AD	60k CWT(LV) 898 PIT
			SUB-TOTAL		729311		6.16	118454		

Appendix T. Summary Of Fish Autopsy

Summary Of Fish Autopsy

Accession No:	97-53	Location:	Clearwater Hatchery
Species:	Steelhead	Autopsy Date:	03/11/97
Strain:	North Fork Clearwater	Age:	Juv
Unit:		Sample Size:	20
Reason For Autopsy:	Prelibibiberation		
Investigator(S):	Munson, Burton		
Remarks:			

	Mean	Standard Deviation	Coefficient Of Variation
Length	0.00	0.00	0.00
Weight	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
Hematocrit	49.55	3.03	0.06
Leucocrit	0.00	0.00	0.00
Serum Protein	00.0	0.00	0.00

*Expressed At KTL Times 10 To The Fifth Power

**Converted From KTL; Expressed As CTL Times 10 To Fourth Power

Values As Percents Of Total Sample

Eyes		Gills		Pseudo-Branchs		Thymus		Mesen. Fat		Spleen		Hind Gut		Kidney		Liver		Bile	
N	20	N	20	N	20	0	20	0	0	B	20	0	20	N	20	A	1	0	0
B1	0	F	0	S	0	1	0	1	0	R	0	1	0	S	0	B	19	1	0
B2	0	C	0	L	0	2	0	2	3	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	0	No	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	20	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=4.00								OT	0		
M1	0																		
OT	0																		

Summary Of Normals

20	20	20	20	20	20	20	20	20	0
Sex M: 0		F: 0		U: 0					

General Remarks:

Fins: Gonads:

Skin: Other:

Submitted by:

Jerry McGehee
Fish Hatchery Manager II

Scott Patterson
Assistant Fish Hatchery Manager

Approved by:

Virgil K. Moore, Chief
Bureau of Fisheries

Tom Rogers
Fish Hatcheries Supervisor